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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Anna H. Dyson

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22428

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02/08/2005

FOLEY AND LARDNER

SUITE 500

3000 K STREET NW

WASHINGTON, DC 20007

EXAMINER

HARRINGTON, ALICIA M

ART UNIT

PAPER NUMBER

2873

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Please find below and/or attached an Office communication concerning this application or proceeding.

(2)

<b>Office Action Summary</b>	<b>Application No.</b> 10/816,933	<b>Applicant(s)</b> DYSON ET AL.	
	<b>Examiner</b> Alicia M Harrington	<b>Art Unit</b> 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 4/5/04 and 5/27/04, 7/9/04.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) 21-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 July 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0504</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The Examiner has partially considered the information disclosure statement filed on 5/27/04. The information disclosure statement failed to comply with requirements under 37 CFR 1.98 which states that each publication listed in an information disclosure statement must be identified by publisher, author (if any), title, relevant pages of the publication, date, and place of publication. The date of publication supplied must include at least the month and year of publication, except that the year of publication (without the month) will be accepted if the applicant points out in the information disclosure statement that the year of publication is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the particular month of publication is not in issue. Web addresses are not sufficient in establishing a date. See MPEP 609.

### ***Drawings***

2. The drawings are objected to because figures 4B-4F, 6A-6B, 9A-9D, 14, 15 are not clear. The Examiner cannot distinguish the features/elements in the drawings. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and

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appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Claim Objections***

4. Claim 16 is objected to because of the following informalities: Claim 16 appears to have a typo in line 6, it appears applicant meant to recite "the photovoltaic cell is mounted in contact with the heat sink". Appropriate correction is required.

#### ***Specification***

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means"

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and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The abstract of the disclosure is objected to because the abstract contains claim language- for example " comprising". Correction is required. See MPEP § 608.01(b).

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1 are rejected under 35 U.S.C. 102(e) as being anticipated by Barone (US 6,700,055).

Regarding claim 1, Barone discloses a Fresnel lens (1; see col. 2, lines 40-65) comprising a substantially polygonal (rectangular shaped lens) focusing portion adapted to focus solar - radiation to a polygonal area (3; see figures 1 and 2).

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barone (US 6,700,055)

Regarding claim 3, Barone discloses a kit for forming a solar module, comprising: a Fresnel lens (1) comprising a substantially polygonal (rectangular shaped lens) focusing portion adapted to focus solar radiation to a polygonal area (3); and a first means (H; see figure 3 and col. 2, lines 40-50) for supporting a solar cell (3) at a predetermined distance from the Fresnel lens such that the solar radiation is focused onto the photovoltaic cell (see figures 1 and 2; col. 2, lines 40-55). However, Barone fails to specifically disclose using photovoltaic cell. Although, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a photovoltaic cell since they are well known for use in solar cells as efficient natural energy concentrators.

11. Claims 2,4-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barone (US 6,700,055) in view of Kaminar et al (US 6,020,554).

Regarding claim 2, Barone discloses the support/backing structure (H) can comprise a variety of support structures (see col. 2, lines 40-51; see figures 1-3). However, Barone fails to specifically disclose the Fresnel lens is a plastic injection molded lens which is adapted to be interlocked or snap fitted as claimed.

However, Kaminar discloses wherein the Fresnel lens comprises a plastic lens (see col. 3, lines 5-10) which is adapted to be interlocked or snap fitted (see col. 2, lines 20-27) onto a backing structure (15,16,18) adapted to support a photovoltaic cell (28; see col. 3, lines 10-60). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was

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made to modify Barone, as taught by Kaminar, to provide an collector that is easily assembled without specialized tools. However, Barone and Kaminar fail to specifically disclose the lens is an injection-molded lens. Although, it would have been further obvious to one of ordinary skill in the art at the time the invention was made to use a plastic injection molded lens, since forming lens using injection molding processes is well known to plastic lenses, it can provide several lenses molded at the same time, and is known in the prior art to produce a quality plastic lenses. Regarding claims 4, Barone discloses an housing where the back support (H) has a first cross sectional (top) area and second cross sectional (bottom) area, but fails to disclose the second area is smaller than the first cross section area.

However, Kaminar discloses the kit of claim 3, wherein the first means comprises a back support structure which has a first cross sectional area (spreads larger at the top near lens) at a first portion adapted to be connected to the Fresnel lens and a second cross sectional area smaller than the first cross sectional area at a second portion adapted to support the photovoltaic cell (15,16, 28; see figure 1 and 2). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Kaminar, to provide an collector that is easily assembled without specialized tools.

Regarding claim 5, Barone and Kaminar disclose the kit of claim 4. However, Barone fails to specifically disclose wherein the back support structure comprises a substantially pyramidal or a substantially conical support structure comprising a translucent, a diffusing or a Fresnel diverging material.

Kaminar further discloses a substantially pyramidal structure comprising a diffusing material (see col. 3, lines 30-35 and figure 2). Thus, it would have been obvious to one of

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ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Kaminar, to provide an collector that is easily assembled without specialized tools.

Regarding claim 6, Barone and Kaminar disclose the kit of claim 4. However, Barone fails to specifically disclose wherein the back support structure comprises a diffusing material which is shaped to block the focused solar radiation from being visible from a back side of the back support structure, and wherein the back side of the back support structure faces away from the Fresnel lens.

Kaminar further discloses a substantially pyramidal back support structure comprising a diffusing material (see col. 3, lines 30-35 and figure 2) where the diffusing material is shaped to focus solar radiation and the sheets are metal. Thus, from the backside the solar radiation is not visible from the back support side. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Kaminar, to provide a collector that receives a good concentration of solar energy and an collector that is easily assembled without specialized tools.

Regarding claim 7, Barone and Kaminar disclose the kit of claim 4. However, Barone fails to specifically disclose wherein the back support structure comprises a substantially pyramidal or a substantially conical support structure comprising a translucent, a diffusing or a Fresnel diverging material.

Kaminar further discloses a substantially pyramidal structure comprising a diffusing material (see col. 3, lines 30-35 and figure 2). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of



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Barone, as taught by Kaminar, to provide an collector that is easily assembled without specialized tools.

Barone further teaches the support can be a scaffling structure. A scaffling structure would be an equivalent to wires or rods support structure. Furthermore, as taught by Kaminar, a snap fit structure, helps when assembling the housing. Thus, it would have still been obvious to one of ordinary skill in the art at the time the invention was made to provide a snap fit configuration, since the collector support would be easily assembled.

Regarding claim 8, Barone and Kaminar discloses the claimed invention except they fail to specifically disclose the kit of claim 4, wherein the Fresnel lens has an area of 0.2 meters square or less, the second area of the support structure comprises an area of 2 cm square or less, and a length of the support structure from the first area to the second area is 30 cm or less. It would have been an obvious matter of choice to design a Fresnel lens and support structure according the claimed dimensions, since such modification would have involved a mere change in size of the component. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237(CCPA 1955).

Regarding claim 9, Barone discloses a solar module, comprising:

a Fresnel lens (1) comprising a substantially polygonal focusing portion adapted to focus solar radiation to a polygonal area; and a back support structure (H) adapted to support a solar cell (3) at a predetermined distance from the Fresnel lens such that solar radiation is focused onto the solar cell;

wherein: the back support structure has first portion (top region) connected to the

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Fresnel lens and a second portion adapted to support the solar cell (3; see figures 1 and 3 and col. 2); and the first portion (top) of the back support structure has a first cross sectional area and a second portion (bottom) of the back support structure has a second cross sectional area.

However, Barone fails to specifically disclose the solar cell is photovoltaic cell and the first cross section area is larger than the second cross section area.

However, Kaminar discloses wherein the back support structure comprises a back support structure which has a first cross sectional area (spreads larger at the top near lens) at a first portion adapted to be connected to the Fresnel lens and a second cross sectional area smaller than the first cross sectional area at a second portion adapted to support the photovoltaic cell (bottom portion of 18; 15, 16, 28; see figure 1 and 2). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Kaminar, to provide an collector which supports a Fresnel lens and that is easily assembled without specialized tools.

Regarding claim 10, Barone and Kaminar discloses the module of claim 9, and Kaminar further disclose the photovoltaic cell (28) connected to the second portion (bottom portion of 18; 15,16) of the back support structure (see figure 2). Again, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Kaminar, to provide an collector that is easily assembled without specialized tools.

Regarding claim 11, Barone and Kaminar disclose the module of claim 10; however, Barone fails to specifically disclose wherein the back support structure comprises a substantially pyramidal or a substantially conical support structure comprising a translucent, a diffusing or a Fresnel diverging material.

Kaminar further discloses a substantially pyramidal structure comprising a diffusing material (see col. 3, lines 30-35 and figure 2). Thus, it would have still been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Kaminar, to provide an collector that is easily assembled without specialized tools and collects a good amount solar radiation.

Regarding claim 12, Barone and Kaminar disclose the module of claim 11; however, Barone fails to specifically disclose wherein the back support structure comprises a diffusing material which is shaped to block the focused solar radiation from being visible from a back side of the back support structure, and wherein the back side of the back support structure faces away from the Fresnel lens.

Kaminar further discloses a substantially pyramidal back support structure comprising a diffusing material (see col. 3, lines 30-35 and figure 2) where the diffusing material is shaped to focus solar radiation and the sheets are metal. Thus, from the backside the solar radiation is not visible from the back support side. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Kaminar, to provide a collector that receives a good concentration of solar energy and an collector that is easily assembled without specialized tools.

Regarding claim 13, Barone and Kaminar disclose the module of claim 10; however, Barone fails to specifically disclose wherein the back support structure comprises a substantially pyramidal or a substantially conical support structure comprising a translucent, a diffusing or a Fresnel diverging material.

Kaminar further discloses a substantially pyramidal structure comprising a diffusing material (see col. 3, lines 30-35 and figure 2). Thus, it would have still been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Kaminar, to provide an collector that is easily assembled without specialized tools and collects a good amount solar radiation.

Barone further teaches the support can be a scaffling structure. A scaffling structure would be an equivalent to wires or rods support structure. Furthermore, as taught by Kaminar, a snap fit structure, helps when assembling the housing. Thus, it would have still been obvious to one of ordinary skill in the art at the time the invention was made to provide a snap fit configuration, since the collector support would be easily assembled.

Regarding claim 14, Barone and Kaminar further teaches the module of claim 10, where in Barone disclose the solar cell comprises a polygonal cell (3) which is mounted at a distance from the Fresnel lens (1) so that a size of an area of solar radiation focused by the Fresnel lens substantially matches a size of the photovoltaic cell radiation receiving area (see figure 3 of Barone).

Regarding claim 15, Barone and Kaminar discloses the claimed invention except they fail to specifically disclose the module of claim 10, wherein the Fresnel lens has an area of 0.2 meters square or less, the second area of the support structure comprises an area of 2 cm square or less, and a length of the support structure from the first area to the second area is 30 cm or less and the photovoltaic cell radiation receiving are is 1.5 cm square or less. It would have been an obvious matter of choice to design a Fresnel lens and support structure according the claimed dimensions, since such modification would have involved a mere change in size of the component. A change

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in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237(CCPA 1955).

Regarding claim 16, Barone and Kaminar disclose the module of claim 10, Barone further comprises: a focusing lens array (2; see col. 4, lines 20-42; functional equivalent of single lens covering the area) located between the Fresnel lens (1) and the solar cell (3); However Barone fails to specifically disclose the solar cell is a photovoltaic cell and a heat sink connected to the second portion of the back support structure, such that the photovoltaic cell is mounted in contact with the heat sink.

Kaminar discloses a Fresnel lens (11) and photovoltaic cell with a heat sink (15) connected to the second portion of the back support (see col. 3, lines 45-65), such that the photovoltaic cell is mounted in contact with the heat sink. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Kaminar, to provide a collector that receives a good concentration of solar energy and an collector that is easily assembled without specialized tools.

Regarding claim 17, Barone and Kaminar disclose the module of claim 16, Kaminar further disclose wherein: the heat sink is selected from a group consisting of radiative type heat sinks (see col. 3), cooling fluid type heat sinks, passive cooling type heat sinks and heat- pipe type heat sinks. However, Barone and Kaminar fail to specifically disclose the photovoltaic cell (a semiconductor is selected from a group consisting of III-V semiconductor solar cells and vertical multi-junction (VMJ) solar cells. Although, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a cell that multi-junction or semiconductor group II-V, since they are well known solar cells in the art (the Examiner takes

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official notice to this fact) and multi-junction cells, for example, can be highly efficient in converting sunlight into direct electricity.

Regarding claims 18-19, Barone and Kaminar disclose the module of claim 16, wherein Kaminar further discloses the Fresnel lens is interlocked or snap fitted to the first portion (top) of the back support structure; and the heat sink (see col. 3) is interlocked or snap fitted to the second portion (bottom portion of 18; 15,16) of the back support structure where photovoltaic cell (28) is attached to the heat sink (15). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the support structure of Barone, as taught by Kaminar, to provide a collector that receives a good concentration of solar energy and an collector that is easily assembled without specialized tools.

Regarding claim 20, Barone and Kaminar disclose the module of claim 10, Barone fails to specifically disclose further comprising at least one air gap between the Fresnel lens and the back support structure.

Kaminar illustrates in figure 5 how the lens and back support structure fit together. As illustrated there exist an air gap in the cavity 56, such that in the connection air gaps exist between the lens and hairpin terminal 53. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Barone, as taught by Kaminar, to provide a collector that receives a good concentration of solar energy and an collector that is easily assembled without specialized tools

### ***Conclusion***

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M Harrington whose telephone number is 571 272 2330.

The examiner can normally be reached on Monday - Thursday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571 272 2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



AMH

Alicia M Harrington  
Examiner  
Art Unit 2873